sive infection of the gingiva and alveolar margins, is entirely warranted, as prophylactic, as palliative and as curative measures.

1052 West Sixth Street.

REFERENCES

1. Haden, R. L.: The Radiographic Diagnosis of Periapical Infection in the Light of Bacteriologic Findings, Dental Cosmos, Vol. 67, pp.38, April 1924.

DISCUSSION

E. F. THOLEN, M. D. (1136 West Sixth Street, Los Angeles)—Doctors Lacey and Johnson have shown a comprehension of the pathology of the mouth not often fully understood by the general practitioner of medicine. The study of their paper will prove helpful to both the physician and dentist. I agree in the main with all that has been said in the paper, but my results from the removal of foci of infection have not always been as successful as I had hoped they would be. There are failures following the extraction of teeth, especially in such conditions as neuralgia, arterial hypertension, chronic nephritis, neurasthenia, and diabetes. I cannot agree with the conclusion that we are warranted in removing pulpless teeth as a prophylactic measure. I believe that pulpless teeth, the roots of which show a live peridental membrane about the apex and a root canal that can be filled, should be treated, filled and retained, providing the patient is not suffering from any systemic disease that could be influenced by a focal infection.

ANDREW B. WESSELS, M. D. (1305 Medico-Dental Building, San Diego)—The mouth and jaws have the natural protection of a very rich blood supply. It is logical that an infection which could become established in the teeth would have considerable invasive power and readily metastasize; thus establishing a secondary infection in a field of lesser vascularity and greater susceptibility, according to the inherent susceptibility or immunity of the patient. The attention of the profession has frequently been called by men devoting their time to research in this field that the radiogram cannot indicate the amount of virulence of the infection nor the degree of susceptibility to the infection; and that some devitalized teeth showing little or no periapical involvement are frequently the greatest offenders. If Doctors Lacey and Johnson are mistaken in their conclusions that all pulpless teeth and all teeth showing extensive infection of the gingivae and alveolar margins should be removed, it is a mistake favoring the side of the physical factor of safety and may offset the occasional unnecessary loss of a useful unit of mastication which loss may be avoided by investigating other possible foci. However, I do not agree with Doctors Lacey and Johnson in such a conclusion, and I do know that many cases showing extensive marginal destruction can be successfully operated unless there is an involvement of the bone between the bifurcations of the multirooted teeth. I do not believe that in the absence of systemic involvement that all pulpless teeth should be removed as a prophylactic measure. However, it is well to bear in mind that while dental infection may have been the primary etiological focus, an established secondary infection may not clear up even though the primary focus is removed. I believe that intelligent treatment must come through careful investigation of each individual case and that the cooperation of a competent dentist is invaluable.

LLOYD BRYAN, M. D. (135 Stockton Street, San Francisco)—The authors' assumption that the incidence of infection in pulpless teeth is almost as high in the radiographic negative group as in the radiographic positive group is not confirmed; but the clinical experience of our best dental surgeons and bacteriological confirmation certainly cannot be accepted without question on account of the almost impossible task, at least under present conditions, of obtaining uncontaminated culture from an extracted tooth.

The principal if not only function of the pulp is to form dentine. Is it fair to assume that a tooth with this dentine forming substance removed and replaced under aseptic condition is dead and infected when the vital peridental membrane is intact? Most dental surgeons do not hesitate to remove a pulp when it has passed its useful period and the restoration of a satisfactory denture requires it. In the hands of competent dentists many of the frankly infected teeth can be restored to normal clinical and radiological appearance. The teeth have a double formative and nutrient supply in the pulp and peridental membrane, and this latter membrane continues its supporting and protective function after the pulp has been removed. Many authorities believe that pyorrhea is the result rather than the cause of a general systemic condition.

The wholesale removal of pulpless teeth and the substitution many times of inefficient uncomfortable appliances may cause havoc with the nervous system or general body health. There are many healthy patients with extremely bad mouth hygiene and infected teeth and many a case of arthritis with perfectly healthy teeth.

In practically all the authors' examples the patients were subjected to other recognized forms of treatment besides removing the pulpless teeth. One wonders if rest and iodids would not have alone reduced the blood pressure in one example; and if rest, diet and relief of constipation in another might not have relieved the so-called "neurasthenic." In face of a general body disturbance the removal of pulpless teeth that are clinically and radiologically normal may at times be of benefit, but it also has potentialities of a great deal of harm. Let us be sure that there is not some other hidden source of infection.

AUTHORS (closing)—We have presented our conclusions based upon our clinical experience. Without further discussion we refer you to the observations and conclusions recently set forth by the department of dentistry of the Mayo Clinic under the direction of Doctor Gardner. Their evidence is far more convincing than we, with our limited facilities, could ever hope to demonstrate.

DIETETIC CONSIDERATIONS IN THE TREATMENT OF OBESITY*

By FRED S. MODERN, M. D.
AND
GRACE E. JOHNSON, A. B.
Arrowhead Springs

DISCUSSION *by Ernest S. du Bray, M.D., San Francisco; Esther B. Clark, M.D., Palo Alto; William M. Happ, M.D., Los Angeles.*

THE following considerations are based partly on a study of the literature of the subject, partly on experimental and clinical experience. The leading idea of the relative etiological importance of mineral and water metabolism in obesity has been widely discussed, and well summarized in the recent edition of Eugene DuBois' "Basal Metabolism in Health and Disease."[1] The practical application of these facts was on the point of being recognized when I took up the consideration of the matter. I will restrict myself as much as possible in the following discussion to fundamentals in the treatment of obesity, since the sub-

* From the Arrowhead Springs Metabolic Clinic, Arrowhead Springs.
* Read before the Los Angeles County Medical Society, October 20, 1927.

ject is too large to permit even a sketchy presentation of the principles involved, especially in regard to the pathological varieties of obesity.

The problem of obesity is strictly a nutritional problem, regardless of the etiology.[2] Whether it is due to overfeeding or to certain disturbances of metabolism, the basic fact undoubtedly is that the intake exceeds the utilized amount of food. This conception would reduce the treatment of obesity to a simple dietetic procedure, that of undernutrition. But all of those who have had experience in the treatment of obesity recall certain cases in which, in spite of the utmost caloric restriction compatible with the patient's well-being, the scales showed disappointing results: not only did the patient not lose weight, but very often actually showed a certain amount of gain.

To the patient as well as to the physician the actual result, that is the reduction of weight, is the only important feature of the treatment. We know well that the caloric intake, say of 800 calories, is insufficient to meet even the basal requirement, and undoubtedly patients on 800 calories have burned up some of their fat deposits. Consequently this added weight must be due to other factors than newly built body tissue.

To elucidate the origin of this gain I performed a number of water-balance tests in obese patients to ascertain whether this gain in weight might be attributable to a possible water retention. The method adopted was the ordinary water test as prescribed by Volhart for functional renal tests. The patient drinks at 7 a. m., 1500 cc. of water: he does not receive any fluid within the next twenty-four hours. For breakfast he receives 45 grams of protein and 4 grams of salt at 7:30 a. m., and is served a dry luncheon and dry dinner, protein and salt-free. The urine is collected at hourly intervals beginning at 8 a. m. for the first four hours; subsequently at two-hourly intervals until 8 p. m., and the night urine from 8 p. m. until 7 a. m. is collected in bulk. The patients were kept under basal conditions throughout the test period. They were confined to bed and sufficient covers were permitted to keep the patient comfortably warm but not enough to produce perspiration. Tests were discarded if a patient perspired slightly over one hour, or perspired profusely at any time. Under these conditions patients with a normal water balance eliminate the entire water, in excess of what has been taken at the start of the test, within four hours, and excrete all the salt that they received within twenty-four hours.

Volhart Test

Protein 45 grams; NaCl. 4 grams; H_2O 1500 cc.
January 22, 1924.

Time	Vol.	Sp. Gr.	% NaCl.	Total NaCl.	T. N.
7– 8	106	1005	0.094	0.10	0.37
8– 9	457	1002	0.080	0.22	0.74
9–10	589	1001	0.073	0.43	0.72
10–11	380	1002	0.15	0.57	0.73
11–12	185	1006	0.25	0.44	0.65
12– 2	145	1012	0.25	0.36	0.78
2– 4	88	1020	0.83	0.73	0.64
4– 6	43	1036	0.96	0.42	0.86
6– 8	58	1032	0.96	0.57	1.13
8– 7	207	1029	0.46	0.98	3.52
Total	2257			4.82	10.34

The results of the tests were uniform in all obese cases. Instead of an output in excess of 1500 cc. in the first four hours they had a water retention of from 30 to 60 per cent: some of the patients showed a positive water balance of from 10 to 30 per cent within the next twenty-four hours.

I am inserting a typical test chart:

Volhart Test

Protein 45 grams; NaCl. 4 grams; H_2O 1500 cc.
Name—No. 1745 March 21, 1924.

Time	Vol.	Sp. Gr.	% NaCl.	Total NaCl.	T. N.	Acid	Urea
7– 8	95	1002	.086	.08	.47	12.9	.66
8– 9	475	1003	.024	.13	.60	14.2	1.30
9–10	332	1004	.029	.10	.47	8.0	.92
10–11	67	1020	.330	.22	.55	5.3	.92
11–12	28	1029	.721	.20	.41	2.5	.42
12– 2	42	1022	.746	.32	.72	28.0	1.05
2– 4	17	1034	.601	.10	.33	7.1	.47
4– 6	65	1032	.622	.41	1.16	40.25	1.12
6– 8	16	1038	.552	.09	.37	15.3	.35
8– 7	170	1030	.305	.52	3.38	64.0	2.72
Total	1307			2.17	8.44	198.4	9.93

These results have been secured after thorough examination of the kidneys, occult edema being excluded. This water retention is well known—even to makers of anti-obesity patent medicines. One of the large pharmaceutical firms includes the following instructions in the pamphlet accompanying its "Anti-Obesity Tablets": "While the patient is under treatment, he must abstain from starches and fats, and should drink very little water."

This water retention can be met in two ways: either by restriction of the water intake as advocated by the above-mentioned patent medicine makers, or by modifying the diet so as to reduce the water avidity of the tissues to a minimum.

In this connection I wish to mention that German authors have used, with more or less success in obesity, the new, powerful diuretic, "Novasurol," a mercury derivative for dehydration of the patient.[3] The same means can be attained in a more agreeable way by the electric light cabinet or similar sweating procedures.

A water restriction seems undesirable, since the chemical examination of the blood and urine of patients on the low calorie diets show invariably the presence of a certain amount of acetone, simply due to a carbohydrate privation acidosis. I had occasion to examine the CO_2 combining power of the plasma in a number of these cases, and found in one instance as low a value as thirty-three volume per cent. The usual value in these cases is subnormal. To meet this starvation acidosis by soda bicarbonate is unfeasible, because it tends to create edema, in other words promotes water retention.

Patients on an unselected low diet are usually feeling weak, tired and exhausted. This is due to their low diet as well as their acidosis. Their energy requirement is amply covered by the utilization of their own fat deposits; it is the ensuing acidosis rather than the starvation that causes the above-mentioned untoward symptoms.

Since the alkalis cannot be used to combat acidosis, on account of their water binding power, and the use of insulin is inadvisable because of

Five Hundred Calory Diet

Diagnosis	NaCl.	Protein	Fat	Carbohydrate	Calories
Obesity	0	50	11	50	500
Breakfast	**Grams**	**Protein**	**Fat**	**C. H.**	**Calories**
Grapefruit	100	1	0	5	148
Eggs	1	7	6	0	
Oatmeal Muffins	1	3	2	3	
Lunch					166
Tomato Salad	100	1	0	3	
Mayonnaise	Mineral Oil				
String Beans	100	2	0	5	
Asparagus	100	1	0	3	
Cottage cheese	45	9	0	2	
Oatmeal muffins	1	3	2	3	
Strawberries	60	1	0	4	
Dinner					185
Broiled chicken	110	18	1	0	
Summer squash	100	1	0	3	
Carrots	90	1	0	8	
Lettuce salad	66	1	0	2	
Mayonnaise	Mineral Oil				
Sliced peaches	100	1	0	9	
Total		50	11	50	499

Vitamins:

* Indicates good source.
** Indicates excellent source.
Incomplete data available on vitamins D and E.

A	B	C	D	E
Egg Yolk**	Grapefruit**	Grapefruit**	Egg Yolk	Lettuce
Carrots**	Tomato*	Tomato*		
Lettuce*	Lettuce*	Lettuce**		
Tomato*	Carrots*	Carrots*		
String beans*	String beans*	Peach*		

Mineral Salts:

Ca	Mg	K	Na	P	Cl	S	Fe	NaCl.
0.735	0.173	2.343	0.676	0.911	0.748	0.685	0.0292	0.722

possible hypoglycemic reactions, it is necessary to carry off as much as possible of these metabolites by abundant diuresis and high water intake. To avoid the retention of water it is necessary to lower the intake of certain minerals. A mineral deficiency in the diet, in the first place that of sodium chlorid, alters the water binding powers of the tissues in such a way that water retention will not occur. In a recent issue of the *Klinische Wochenschrift,* Starkenstein [4] proved this point experimentally. Functional water tests which I have done on obese patients on a salt-free regimen show that when this precaution is carried out the water balance becomes negative, and the four-hourly output is in excess of the test intake.

The regimen which we are following as a routine in uncomplicated cases of obesity consists, as closely as possible, of an adequate protein intake, since protein restriction in the treatment of obesity—in addition to the acidosis—produces a notable weakness. We also maintain as high a carbohydrate intake as possible, within the caloric limits, in order to reduce the acidosis to a minimum. We restrict the patient's salt intake to a maximum of 2 grams daily. If the patient fails to show a satisfactory loss in body weight the salt is promptly withdrawn altogether. The usual response is a considerable increase in the diuresis, as well as a notable diminution of the patient's thirst.

The diets, in addition that they must meet the patient's protein requirement and obviate a carbohydrate privation acidosis, must contain the necessary vitamins and, if feasible, should contain calcium and phosphates in adequate quantity, a point that is frequently overlooked in reducing dietaries.

Such a regimen, however, can never be carried out in the patient's home. Institutional treatment is absolutely necessary, and only then of avail if a skilled dietitian, experienced in the handling of metabolic patients, is available.

Fillers, like agar-agar and similar substances, must be used to give sufficient bulk to insure regular bowel movements, since not only the low amount of ingested food, but especially a salt-free diet, is notoriously constipating.

Constipation, in connection with the acidosis, may be a seriously disturbing factor. Headache, malaise, nausea, vomiting, and an increasing feeling of weakness, are often the consequences of unskilled management of reducing dietaries. But if the above-mentioned precautions are taken, these symptoms are rarely of importance. The softness and lubrication of the feces will be in-

Six Hundred Calory Diet

Diagnosis	NaCl.	Protein	Fat	Carbohydrate	Calories
Obesity	0	60	13	60	600
Breakfast	**Grams**	**Protein**	**Fat**	**C. H.**	**Calories**
Cantaloupe	100	1	0	10	168
Eggs	1	7	6	0	
Oatmeal muffins	1	3	2	3	
Lunch					223
Cucumber salad	66	1	0	2	
Oatmeal muffin	1	3	2	3	
Cauliflower	100	1	0	4	
Zucchini	100	1	0	3	
Cottage cheese	100	21	1	4	
Strawberries	70	1	0	5	
Mayonnaise	Mineral Oil				
Dinner					206
Lettuce salad	66	1	0	2	
Mayonnaise	Mineral Oil				
Asparagus	100	1	0	3	
Carrots	100	1	0	9	
Tomato	100	1	0	3	
Smelt	90	16	2	0	
Apricots	70	1	0	9	
Total		60	13	60	597

Vitamins:

* Indicates good source.
** Indicates excellent source.
Incomplete data available on vitamins D and E.

A	B	C	D	E
Egg yolk**	Cantaloupe*	Lettuce**	Egg yolk	Lettuce
Carrots**	Carrots*	Tomato**		
Cantaloupe*	Tomato*	Carrots*		
Tomato*	Cauliflower*			
Lettuce*	Lettuce*			

Mineral Salts:

Ca	Mg	K	Na	P	Cl	S	Fe	NaCl.
1.134	0.192	2.490	1.193	1.320	1.331	0.878	0.0098	0.870

sured by the use of mineral oil, which is served in mayonnaise.

I wish to say a word or two about the Spa treatment of obesity, which has a wide reputation. The success is commonly ascribed to the healing "waters" of that particular spring. The explanations of the result are, however, a shameful record of medical commercialism and superstition. As a matter of fact, the famous Carlsbad treatment of obesity consists of eating little, much exercise, the induction of sweating, and the ingestion of huge amounts of hypertonic solutions, which lead to a rapid dehydration of the body. Essentially these measures are correct. The waters are alkaline, and therefore possibly useful in neutralizing some of the acid waste products previously mentioned. The misleading of the patient by unduly laboring unessential details and the careful suppression of relevant ones is reprehensible.

For the patient whose basal metabolism is below normal, the administration of thyroid extract in sufficient doses to raise the value to normal is indicated. I must add that thyroid medication in uncomplicated cases of obesity, for reasons mentioned above, constitutes an abuse of sound therapeutics. Strouse et al.[5] have shown that a hypothyroid origin obtains in only a small percentage of obesity patients—in our experience only about 15 per cent of the cases show a basal metabolism value below 10 per cent. Very often thyroid medication, even in hypothyroid cases, will produce little or no practical results. In these cases we follow Schmidt and Lorant's[6] method of sensitizing the patient with foreign protein injections, usually milk, beginning with 1 to 3 cc. and increasing the dose every few days until a reaction is obtained.

To what lengths in this connection some authors may go is shown by a recent article of Rachel Hirsch,[7] wherein she advocates the non-dietary treatment of obesity, and relies solely on thyroid medication and foreign protein injections in unselected cases. Thyrotoxic reactions very often follow such rash methods of treatment, which may be described as sheer fanaticism.

I will touch here only lightly on the other phases of obesity. They are partly too well known, partly too obscure to merit a thorough discussion. I will only mention postpartum obesity, that associated with deficiency of the posterior lobe of the pituitary gland, and postclimacteric obesity. The type in these cases is often mixed—the etiology may be partly overfeeding, partly a concomitant

Eight Hundred Calory Diet

Diagnosis	NaCl.	Protein	Fat	Carbohydrate	Calories
Obesity	2	60	13	111	800
Breakfast	**Grams**	**Protein**	**Fat**	**C. H.**	**Calories**
Orange	100	1	0	10	182
Eggs	1	7	6	0	
Toast	20	2	0	12	
Lunch					289
Cabbage Salad	50	1	0	3	
Mayonnaise	Mineral Oil				
Carrots	100	1	0	9	
Cauliflower	100	1	0	4	
Cottage cheese	80	17	1	3	
Baked apple	100	1	0	20	
Bread	15	2	0	8	
Dinner					326
Lettuce salad	66	1	0	2	
Mayonnaise	Mineral Oil				
String beans	100	2	0	5	
Hubbard squash	90	1	0	8	
Veal cutlet	80	19	6	0	
Figs	100	1	0	19	
Bread	15	2	0	8	
Total		60	13	111	797

Vitamins:

* Indicates good source.
** Indicates excellent source.
Incomplete data available on vitamins D and E.

A	B	C	D	E
Egg yolk**	Orange*	Orange**	Egg yolk	Lettuce
Carrots**	Cabbage*	Cabbage**		
Lettuce*	Carrots*	Lettuce**		
String beans*	Cauliflower**	Carrots*		
Squash*	Lettuce*	Apple*		
	String beans*			

Mineral Salts:

Ca	Mg	K	Na	P	Cl	S	Fe	NaCl.
1.204	0.199	2.516	1.092	1.149	1.328	0.786	0.0102	0.756

hypothyroidism (especially notable in the postclimacteric obesity).

In pituitary and postclimacteric cases, gland injections are sometimes of a certain limited value, with or without thyroid. Thyroid medication should be, in these as in any other cases of obesity, restricted to those with a true thyroid deficiency, as proved by a lowered basal metabolism.

In closing I wish to emphasize again that obese patients as a rule retain water under normal conditions, and even more so when on an undernutrition diet. This water retention can be met by a limitation of the mineral intake, notably that of sodium chlorid. The other difficulty in the treatment of obesity—acidosis—must be met by an adequate carbohydrate supply, and the protein, vitamin, calcium, phosphate and iron intake must be kept up to maintenance level at least.

Drugs and gland products are only indicated in certain selected cases of known etiology.

Arrowhead Springs.

REFERENCES

1. Du Bois, Eugene: Basal Metabolism in Health and Disease, 1927.

2. Jones, Horry M.: Metabolism in obesity, basal metabolic rate in simple and pathological obesity, J. Lab. & Clin. Med., July, 1926, xi, 959-67.

3. Bayor, D.: Potent remedy, etc., Wien. klin. Wchnschr., 1926, xxxix, 333.

4. Starkenstein, Rudolf: Experimental studies on thirst, Klin. Wchnschr., 1927, vi, 147.

5. Dye, M., Strouse S., and Wang, C. C.: Studies on metabolism of obesity, Arch. Int. Med., 1924, xxxiv, 275.

6. St. Lorant, I.: Protein therapy of obesity, Wien. Arch. f. Inn. Med., 1924, ix, 341-56.

7. Hirsch, Rachel: Non-dietary treatment of obesity, Med. Klin., 1926, xxii, 1714.

DISCUSSION

ERNEST S. DU BRAY, M. D. (870 Market Street, San Francisco)—There are numerous observers who will not agree with one of the preliminary statements of the authors, namely, "that the problem of obesity is strictly a nutritional one, regardless of the etiology." The underlying causes of obesity remain obscure. However, we do see both exogenous and endogenous types and, further, the important mixed type in which both chemical and endocrine factors are at work.

The idea of restricting salt and water in the treatment of obesity is not new, but has been advocated especially by continental clinicians for some years. These measures must be supplemented with a reduction in the total diet and a limitation of the fat content. In my own work I usually allow most patients a total diet of 1200 calories per twenty-four hours, of which the fat does not exceed 75 grams, and the rest is made up of protein and carbohydrate. It is true that some patients fail to lose weight on such a diet and further restrictions are necessary.

In the presence of vascular hypertension associated with overweight a salt-poor diet is often useful both

Twelve Hundred Calory Diet

Diagnosis	NaCl.	Protein	Fat	Carbohydrate	Calories
Obesity	2	70	20	185	1200
Breakfast	**Grams**	**Protein**	**Fat**	**C. H.**	**Calories**
Prunes	100	1	0	20	412
Orange juice	100	0	0	12	
Eggs	2	14	12	0	
Toast	40	5	0	24	
Lunch					386
Grated carrot salad	66	1	0	6	
Mayonnaise	Mineral Oil				
Brussels sprouts	100	1	0	3	
Corn	100	3	1	20	
Codfish	90	17	1	0	
Grapes	100	1	0	20	
Bread	30	3	0	17	
Dinner					402
Tomato-lettuce salad	100	1	0	3	
String beans	100	2	0	5	
Turnips	100	1	0	7	
Baked potato	100	2	0	18	
Roast chicken	50	14	6	0	
Raspberries	100	1	0	13	
Bread	30	3	0	17	
Total		70	20	185	1200

Vitamins:

* Indicates good source.
** Indicates excellent source.
Incomplete data available on vitamins D and E.

A	B	C	D	E
Egg yolk**	Orange*	Orange**	Egg yolk	Lettuce
Carrots**	Prunes*	Tomato**		
Tomatoes*	Corn*	Raspberries**		
String beans*	Carrots*	Lettuce**		
Prunes*	Tomato*			
Lettuce*	String bean*			
	Turnips*			
	Potato*			
	Lettuce*			

Mineral Salts:

Ca	Mg	K	Na	P	Cl	S	Fe	NaCl.
0.446	0.297	3.486	0.860	1.049	1.080	1.103	0.0152	0.860

in relieving the disagreeable symptoms due to vascular disturbance and also in reducing the body weight. I have not used limitation of fluid intake in the treatment of uncomplicated obesity. It may be a valuable measure to adopt when combined with salt-poor diets as the present authors advocate. The place of thyroid feeding in the management of certain types of obesity is well established.

It is, of course, ideal to have patients undergoing reduction regimens in hospitals or institutions where all factors can be readily controlled. We all realize that it is only a small proportion of patients who are willing and able to spend the time and money necessary for such hospitalization. Consequently methods elaborate and complicated are not practical for the average patient. I find a little time spent in the beginning, instructing the patient with reference to food values and the preparation of quantitative diets, is the most effective therapeutic measure available.

Until comparatively recently obesity has received scant attention by the medical profession. With the increasing knowledge of its importance as a precursor of diabetes, cardiorenal-vascular diseases and the arthropathies, strenuous efforts are now being made to salvage this condition from the hands of the quacks and faddists who have long recognized it as an important source of revenue.

The cooperation of the obese patient can usually be obtained if the physician in charge can offer a definite program constructed on rational and positive dietetic and physiotherapeutic lines. About all avoid too rapid reduction of the obese because this is attended with certain real dangers.

❦

ESTHER B. CLARK, M. D. (300 Hamilton Avenue, Palo Alto)—The authors are quite right in their primary statement that obesity is primarily a nutritional disturbance, *i. e.*, a caloric intake which exceeds the caloric output. The factors causing the nutritional disturbance may be any of several, anything in fact that decreases the energy expenditure or alters the normal appetite regulatory mechanism so that the caloric intake will be excessive.

The study here presented on the water retention in obese individuals is a distinct contribution, and does much to explain the failure of many obese individuals to lose on a low caloric diet, at least for some time. The treatment with a low salt diet combined with a low caloric intake is entirely logical.

It is rather difficult to conceive of patients failing to lose weight if they are kept on a diet well below their caloric expenditure over a sufficiently long period. There must be a point beyond which there is no longer a water retention, and then weight loss occurs. The tissue metabolism must continue independently of the water and salt metabolism. We have never seen a

water retention sufficient to result in a demonstrable edema in an obese individual (with normal renal and cardiac function) who was on a reducing regimen.

❦

WILLIAM M. HAPP, M. D. (523 West Sixth Street, Los Angeles)—It is a pleasure to read a paper on the treatment of obesity in which the endocrine glands are relegated to a minor rôle, and the attention centered on the diet as the factor par excellence in weight production and reduction. There is undoubtedly some factor responsible for the fact that some individuals put on weight easily and others with difficulty. This tendency to "easy fattenability" is strikingly familial and can be observed in young babies. There are, however, no reliable data proving that the glands of internal secretion are primarily responsible for this condition. The peculiarity in metabolism of these patients makes it more difficult for them to lose weight than is the case with other individuals. It is interesting that only 15 per cent of Doctor Modern's patients showed basal metabolism of — 10 or less, indicating that hypothyroidism plays only a minor rôle in these cases.

The most interesting point advanced by the authors is the rôle of water metabolism in the obese and the importance of salt restriction in combating the water retention present in these patients. The tendency to water retention is probably only one expression of the metabolic peculiarity of the obese, and further studies in mineral metabolism should be of great importance.

The degree of acetone body acidosis which develops during the first few days on a low caloric diet is not, in our opinion, of any serious consequence unless the carbohydrate reduction be made too abruptly. In those patients who develop a ketosis readily, this can be corrected by increasing the carbohydrate intake with subsequent more gradual reduction. A sudden reduction from the patient's usual diet to an intake of 50 grams of carbohydrate (diet I) would almost certainly produce a degree of ketosis due to the sudden attack on the body fat. A gradual reduction in carbohydrate would obviate this.

The emphasis on an ample protein, mineral and vitamin content of the reduction diet is certainly well founded. The diets should be planned, as the authors have done, to prevent a deficiency in these elements. This is particularly important in children and adolescents where the factor of growth must be allowed for. The whole subject of weight reduction has been surrounded by a veil of mystery and secrecy, which has been fostered by quacks and promoters of patent cures. In putting this subject on a scientific plane the authors have rendered a real service.

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DOCTOR MODERN (closing)—It is true that continental physicians have advocated the restriction of the salt intake in obesity in the past few years, but as demonstrated in a recent paper by Franz Kisch of Marienbad, have never carried it to its logical conclusion. Probably owing to the fact that the problem of obesity was taken up most extensively by physicians practicing in Spas, the salt restriction was usually accompanied by the intake of highly mineralized waters which more than offset any possible benefit of the sodium chlorid restriction in the diet. Moreover, salt restriction means about 2 to 5 grams of NaCl according to continental conception. (See David, O., Treatment of Obesity, Med. Klin., 1925, xxi, 1751.) In connection with the salt-free diet, which lowers thirst considerably, it is necessary to advise the patient to drink a certain minimum amount of water with no upper limits for reasons already mentioned. We usually advise about from one and a half to two quarts a day.

The purpose of this paper is to call attention to the necessity of a scientific treatment of obesity. This can be done only by careful analysis of the individual case. The prevalent vogue of indiscriminate feeding of thyroid is as pernicious as the equally popular orange-juice fast. The former has its place only in those patients whose basal metabolism is definitely lowered, the latter disregards all principles of sound dietetics. The obese patient has been too long a victim of unscrupulous practitioners, medical and otherwise.

I fully agree with Doctor du Bray that the intelligent cooperation of the patient is absolutely necessary. At Arrowhead Springs the patient is taught daily by the dietitian how to calculate his diet and what are the principles underlying it. The patient himself has to make out his own menu toward the end of his stay, and, via palate and scales, he quickly learns to realize pitfalls and difficulties. I believe that a diet of 1200 calories with a fat intake in the neighborhood of 75 grams leaves too little leeway, either for an adequate protein or carbohydrate intake. Our 1200 calorie obesity diet contains never more than 30 grams of fat, so that the patient receives almost normal meals except for butter, fat meats, and rich desserts.

No originality is claimed for any of our contentions, but if this paper has succeeded in calling attention to some difficulties, certain principles and also abuses in the management of the obese patient, it has achieved its purpose.

THE TECHNIQUE OF LARYNGECTOMY*

By H. B. GRAHAM, M. D.
San Francisco

DISCUSSION *by I. W. Thorne, M. D., San Francisco; James F. Percy, M. D., Los Angeles; Simon Jesberg, M. D., Los Angeles.*

THIS paper will deal only with those favorable cases of intrinsic carcinoma of the larynx which have been discovered early and do not show the extensive gland or esophageal involvement which necessitates wide dissection.

It would be a boon to these patients if the general physician would call in a laryngologist as soon as a hoarseness became chronic, for it is only through early interference that any hope can be given to the poor sufferer from this dread disease. Those cases are most favorable which are limited by the cartilaginous box and which have not been interfered with before biopsy. Whether we elect x-ray, fulguration, radium or surgical intervention or a combination of some of these methods, they are always more successful if the case has not been irritated by ill-advised attempts with local applications.

PREOPERATIVE CARE

All patients will be immeasurably more comfortable after the operation if they have been properly studied and prepared beforehand. The teeth should be put in the best possible repair. The mouth is hard to sterilize and hard to keep clean during and immediately succeeding the operation and an attempt should be made to put it in good condition for a few days preceding the operation. Any of the accepted methods such as swabbing with acroflavin may be used. It is wise to avoid much interference with the pharynx during the operation, as the anesthesia may be much lighter by so doing, and the possibility of vomiting and soiling the wound lessened.

Before operation, the diet, blood pressure, urine, blood analysis, and general condition of the patient should be thoroughly studied and regu-

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